Haenckе, *P. cæsia*, Sm., *Agrostis rupestris*, All., *Carex nigra*, All.; but then, on the 28th of July, 1846 (the temperature of the air in the shade being 48°·9 Fahr., in the sun 52°·5 Fahr.), the schistose gravel of the rock in which these plants vegetated indicated a temperature of 84°·2. As a contrast, I will again cite Spitzbergen. This archipelago, whose shores may equally be regarded as touching the limits of eternal snows, occupies no less than 4½° of latitude by 12° of longitude, and yet contains no more than 82 Phanerogamia.

In the Alps, the plants are heated by the soil which bears them more than by the air which surrounds them; a vivid light favours their respiratory functions; and even when the temperature descends to the freezing-point during the day, a layer of recent snow preserves them even in summer from the accidental chills which always accompany bad weather on high mountains. Equally sensitive to cold and heat, they can only bear temperatures between about 32° and 59°; constantly moistened by clouds or irrigated by the water flowing from the melting snow, they require the utmost care to make them prosper in the plains; for the gardener must defend them against the cold of winter and the heats of summer, yet without keeping them from the influence of light. At Spitzbergen, on the contrary, in spite of the perpetual day of summer, the vegetation is poor and scattered, because the rays of the sun, being for the most part absorbed by the great thickness of the atmosphere and the continual fogs, can neither heat nor illuminate this frozen country.—*Comptes Rendus*, May 16, 1859.

Note on the Artificial Propagation of Salmon.

By A. D. Bartlett.

The Committee of the Australian Association have been trying a series of experiments with a view of ascertaining the possibility of conveying Salmon to Australia, for the purpose of introducing this noble fish into the rivers of that country. The difficulty is to convey them across the tropics; and the object of these experiments, which have been carried on in the Crystal Palace under my supervision, has been—

1. To filter a sufficient quantity of water to supply a running stream for the spawn or young fish.

2. To ascertain the highest amount of temperature in which they would live.

3. To discover the best and most economical means of lowering the temperature, that they may be kept alive while passing the tropics.

In order to accomplish the first object, arrangements were made with the Charcoal Filter Company to fix filters to supply a running stream through long boxes, which were partly filled with gravel and small stones, upon which the Salmon ova were to be placed.

Mr. Ramsbottom being engaged to obtain the ova, to ensure their being perfectly impregnated, and to deposit them in the breed-

ing place in the Crystal Palace, proceeded to Wales, and on the 5th of February obtained from two female fish at least 20,000 ova, which, by the usual process adopted in the artificial propagation of fish, he rendered fertile, and then starting immediately for the Crystal Palace, arrived there February 7th, and deposited the ova in the breeding-boxes, which had been duly prepared. Unfortunately, at this time the filters had ceased to act, and the water supplied by the Lambeth Water Company was obliged to be laid on in its usual state. In a few days the ova and the bottom of the breeding-boxes became covered with a dark deposit, from the impure condition of the water, and large numbers of the ova died daily in consequence. Another batch of filters was then fixed, and a fresh supply of filtered water obtained; and no more sediment was deposited upon the ova. Notwithstanding this, they continued to die for some days; but about the 20th, the whole of the deposit, which had settled upon the bottom of the boxes and upon the ova, began to rise towards the surface in the form of Confervæ; the bottom of the boxes and the remaining ova appeared quite fresh and clean; the surviving ova rapidly assumed the perfect state of the young fish; and on March 7th the young fry began to move about (the outer covering being thrown off), endeavouring to hide themselves between the stones and gravel. The temperature of the water during this experiment was 57°. In order to ascertain if any advantage could be gained by placing some of these in filtered water at a lower temperature, a number of them were carefully removed to a glass tank, supplied with a fountain at the temperature of 54°. In this they appeared to be doing well, were evidently larger and more active, and exhibited great promise. Unfortunately, on the morning of the 13th, the workmen having been ordered to make some alteration in the water pipes in the building, turned off the water, leaving the young salmon, together with the ova which had not yet been hatched, five or six hours without fresh water, in the tropical end of the building: in consequence of this, they were all destroyed, and this interesting experiment delayed for a whole year, as it is impossible to obtain the ova until the next breeding-season.

There are, however, some important facts learned from this experiment, one of which is the early period of hatching. Previous experiments have shown that 60 days usually expire before the young come to life; sometimes 140 days have passed. This experiment has proved that the young fish can be hatched in 30 days: it yet remains to be tested whether this is an advantage. It is certain that in the case of more highly organized and warm-blooded animals, their production at an earlier period than the ordinary one is attended, if not with death, at least with great debility; while, on the other hand, it is not possible to retard the operations of nature beyond the ordinary period without destroying the mother or the offspring. There are many circumstances that induce the belief that the young fish would be stronger by the early development; but no positive conclusion can be arrived at without further experiments.—*Proc. Zool. Soc.* Mar. 8, 1859.